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United States Department of Agriculture
Bureau of Entomology and Plant Quarantine

METHODS USED TO COMBAT THE WHITE-FRINGED BEETLES

Prepared in Division of Domestic Plant Quarantines

Two species of white-fringed beetles (Pantomorus leucoloma Boh. and P. peregrinus Buch.) have in recent years caused considerable damage to crops in some localities of southern Alabama, northwestern Florida, southeastern Louisiana, and southern Mississippi. At the close of the calendar year 1939 the known infested area totaled approximately 71,000 acres in the 4 affected States. The 2 species are similar in appearance and habits. They are destructive in both larval and adult stages to a wide range of crops, the most serious injury being caused by the feeding of the larvae on plant roots. Among the crops most severely damaged are corn, cotton, potatoes, peanuts, and other legumes. In the absence of favored host plants, however, the insects feed on, and cause economic damage to, practically all types of succulent vegetation.

Life History

Both species of white-fringed beetles pass the winter chiefly as larvae in the soil. The larvae are white, grublike, and about half an inch long when full-grown. Most of them become mature in May or June. They pupate in cells in the soil, and the adults begin to emerge late in May or early in June, the main emergence being between mid-June and late in July. The robust, dark-gray adult beetles are about seven-sixteenths of an inch long, have a thick snout, are unable to fly, and are all females. Individuals have been known to live for almost 6 months, although most of them probably survive a much shorter time under natural conditions. They lay their eggs in small masses which are difficult to find, usually at or just below the surface of the soil in contact with bits of old plant stem, sticks, or pebbles. A single beetle ordinarily lays 600 or 700 eggs, although individuals have been known to lay over 3,000. In warm weather, with plenty of moisture, the eggs hatch in about 2 weeks, and the little larvae immediately enter the soil, where they remain, feeding more or less actively on plant roots, until they complete their growth. There is normally one generation a year.

Control Measures

Since 1937 the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture, in cooperation with the affected States, has been conducting research and suppressive activities against these insects throughout the infested areas, and Federal and State quarantines are enforced to prevent their spread.

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The types of control measures used are based on information obtained from field observations of the life history and habits of the pests and other studies, which show that white-fringed beetles cannot fly, that they require green food in order to survive and lay eggs in any numbers, that their egg-laying capacity is greatly reduced by the elimination of favored host plants, and that they are easily killed by the heat when exposed on bare ground to the direct rays of the sun, as well as by insecticides, such as calcium arsenate and cryolite, when applied to their food plants. Based on such information, the following suppressive measures are used:

(1) Clean cultivation of infested fields to eliminate all vegetation during the period of adult activity.

(2) Use of an oil-base sodium-arsenite herbicide to eliminate host vegetation on waste and abandoned areas, on railroad yards, and in the vicinity of processing plants and other places from which there is danger of artificial spread of the pests unless they are suppressed.

(3) Use of insecticides, such as calcium arsenate and cryolite, to destroy the adult beetles.

(4) Use of soil fumigants to destroy the larvae.

(5) Modification of farm practices, in cooperation with farmers, to allow more effective use of insecticides by eliminating, insofar as practicable, the planting of certain leguminous crops, especially the interplanting of such crops with corn.

One or more of these suppressive measures, or a combination of them, are applied on all known infested acreage. As a result of such control there has been a drastic reduction in population of the pest throughout all the infested areas, and the beetles have apparently been eradicated from several of the more isolated areas.

Further information relative to the progress of suppressive activities may be obtained from the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C., or from the Bureau's field station at Gulfport, Miss. (P. O. Box 989).